

# TLP627A, TLP627A-2, TLP627A-4

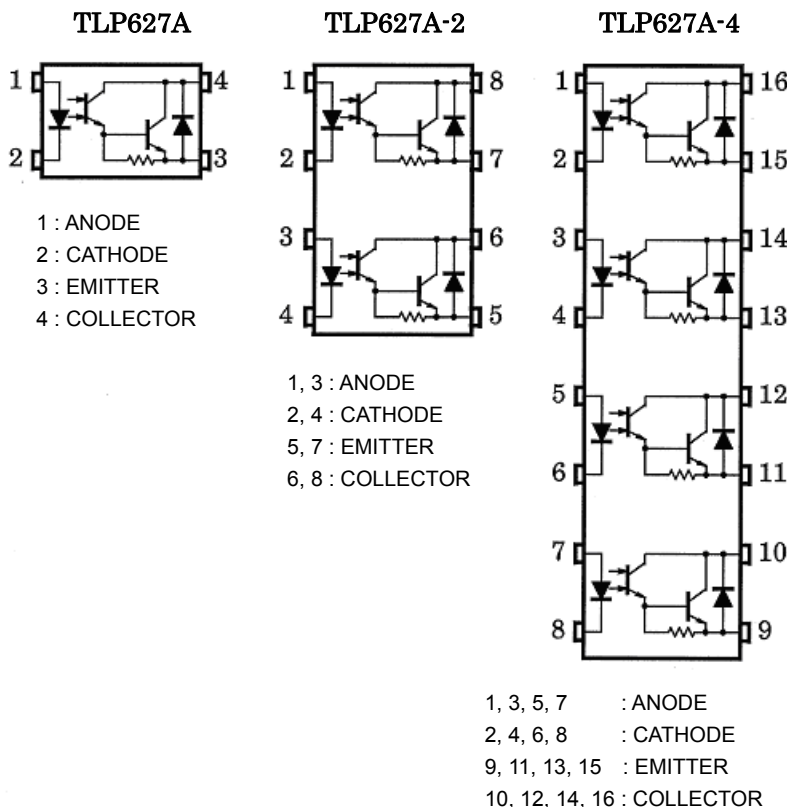
TELECOMMUNICATION  
PROGRAMMABLE CONTROLLERS  
DC-OUTPUT MODULE

The TOSHIBA TLP627A, -2, and -4 consist of a gallium arsenide infrared emitting diode optically coupled to a darlington connected phototransistor which has a 350V high voltage of collector-emitter breakdown voltage.

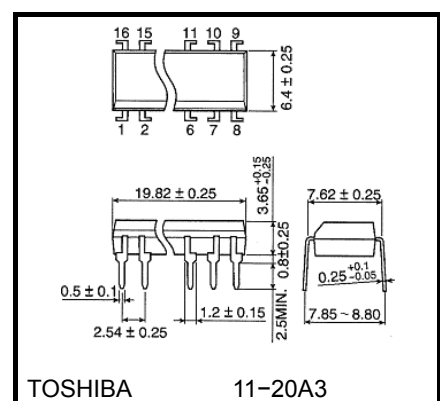
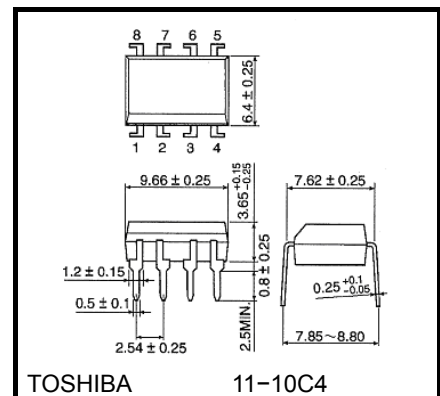
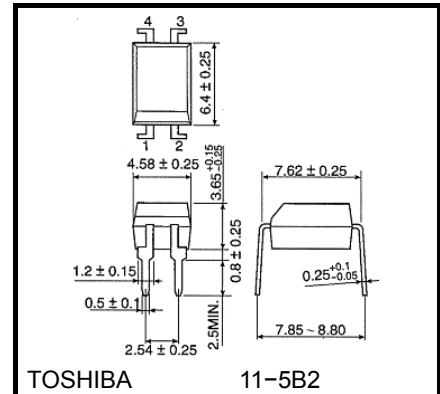
The TLP627A-2 offer two isolated channels in a eight lead plastic DIP package, while the TLP627A-4 provide four isolated channels per package.

- Collector-Emitter Voltage : 350V(MIN)
- Current Transfer Ratio : 1500% (MIN)
- Isolation Voltage : 5000Vrms(MIN)

## Pin Configuration (top view)



単位: mm



## Absolute Maximum Ratings (Ta = 25°C)

CHARACTERISTICS	SYMBOL	RATING		UNIT	
		TLP627A	TLP627A-2 TLP627A-4		
LED	Forward Current	I <sub>F</sub>	60	50	mA
	Forward Current Derating	ΔI <sub>F</sub> /°C	-0.7 (Ta ≥ 39°C)	-0.5 (Ta ≥ 25°C)	mA /°C
	Pulse Forward Current	I <sub>FP</sub>	1 (100 μs Pulse, 100 pps)		A
	Reverse Voltage	V <sub>R</sub>	5		V
DETECTOR	Collector-Emitter Voltage	V <sub>CEO</sub>	350		V
	Emitter-Collector Voltage	V <sub>ECO</sub>	0.3		V
	Collector Current	I <sub>C</sub>	150		mA
	Collector Power Dissipation (1 circuit)	P <sub>C</sub>	150 (300) (*)	100	mW
	Collector Power Dissipation Derating (Ta ≥ 25°C, 1 Circuit)	ΔP <sub>C</sub> /°C	-1.5 (-3.5) (*)	-1.0	mW /°C
	Storage Temperature Range	T <sub>stg</sub>	-55~125		°C
Operating Temperature Range	T <sub>opr</sub>	-55~100		°C	
Lead Soldering Temperature	T <sub>sol</sub>	260 (10 sec)		°C	
Total Package Power Dissipation (1 circuit)	P <sub>T</sub>	250 (320) (*)	150	mW	
Total Package Power Dissipation Derating (Ta ≥ 25°C, 1 circuit)	ΔP <sub>T</sub> /°C	-2.5 (-3.2) (*)	-1.5	mW /°C	
Isolation Voltage	BV <sub>S</sub>	5000 (AC, 1 min, R.H. ≤ 60%) (**)		V <sub>rms</sub>	

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

\* : I<sub>F</sub> = 20 mA max

\*\* : Device considered a two terminal device : LED side pins shorted together and DETECTOR side pins shorted together.

## Recommended Operating Conditions

CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V <sub>CC</sub>	—	—	200	V
Forward Current	I <sub>F</sub>	—	16	25	mA
Collector Current	I <sub>C</sub>	—	—	120	mA
Operating Temperature	T <sub>opr</sub>	-25	—	85	°C

Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

## Individual Electrical Characteristics (Ta = 25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
LED	Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 10 mA	1.0	1.15	1.3	V
	Reverse Current	I <sub>R</sub>	V <sub>R</sub> = 5 V	—	—	10	μA
	Capacitance	C <sub>T</sub>	V = 0, f = 1 MHz	—	30	—	pF
DETECTOR	Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> = 0.1 mA	350	—	—	V
	Emitter-Collector Breakdown Voltage	V <sub>(BR)ECO</sub>	I <sub>E</sub> = 0.1 mA	0.3	—	—	V
	Collector Dark Current	I <sub>CEO</sub>	V <sub>CE</sub> = 300 V	—	10	200	nA
			V <sub>CE</sub> = 300 V, Ta = 85°C	—	—	20	μA
Capacitance Collector to Emitter	C <sub>CE</sub>	V = 0, f = 1 MHz	—	10	—	pF	

## Coupled Electrical Characteristics (Ta = 25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Current Transfer Ratio	$I_C / I_F$	$I_F = 1 \text{ mA}, V_{CE} = 1 \text{ V}$	1500	4000	—	%
Saturated CTR	$I_C / I_F (\text{sat})$	$I_F = 10 \text{ mA}, V_{CE} = 1 \text{ V}$	500	—	—	%
Collector-Emitter Saturation Voltage	$V_{CE} (\text{sat})$	$I_C = 15 \text{ mA}, I_F = 1 \text{ mA}$	—	—	1.0	V
		$I_C = 100 \text{ mA}, I_F = 10 \text{ mA}$	0.3	—	1.2	

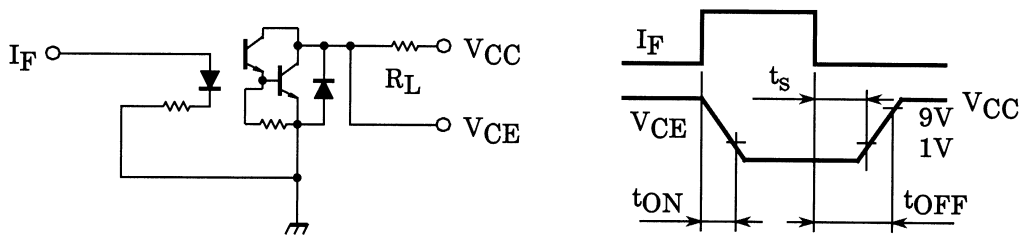
## Isolation Characteristics (Ta = 25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	$C_S$	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation Resistance	$R_S$	$V_S = 500 \text{ V}, R.H. \leq 60\%$	$5 \times 10^{12}$	$10^{14}$	—	$\Omega$
Isolation Voltage	$BV_S$	AC, 1 minute	5000	—	—	Vrms
		AC, 1 second, in oil	—	10000	—	
		DC, 1 second, in oil	—	10000	—	Vdc

## Switching Characteristics (Ta = 25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Rise Time	$t_r$	$V_{CC} = 10 \text{ V}$ $I_C = 10 \text{ mA}$ $R_L = 100 \Omega$	—	40	—	$\mu\text{s}$	
Fall Time	$t_f$		—	15	—		
Turn-on Time	$t_{on}$		—	50	—		
Turn-off Time	$t_{off}$		—	15	—		
Turn-on Time	$t_{ON}$	$R_L = 180 \Omega$ $V_{CC} = 10 \text{ V}, I_F = 16 \text{ mA}$	—	5	—	$\mu\text{s}$	
Storage Time	$t_s$		(Fig.1)	—	40		—
Turn-off Time	$t_{OFF}$		—	—	80		—

Fig.1: SWITCHING TIME TEST CIRCUIT



**RESTRICTIONS ON PRODUCT USE**

20070701-EN

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